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# WATER QUALITY
# MEMORANDUM
## Utah Coal Regulatory Program

January 12, 2010

TO: Internal File

THRU: James D. Smith, Permit Supervisor JDS 01/19/10

FROM: Steve Christensen, Environmental Scientist III SKC

RE: 2009 2nd Quarter Water Monitoring, Consolidation Coal Company, Hidden Valley Mine, C/015/0007-WQ09-2, Task ID #3329

The Hidden Valley Mine is in reclamation. At present, the Permittee has no immediate plans for additional coal mining activity at the site. Two surface-water monitoring sites are established to monitor Ivie Creek, a perennial stream adjacent to the mine site. The sites; Upper Ivie #1, and Lower Ivie #2, have been established to quantify any changes in quality or quantity to the Ivie Creek drainage as a result of coal mining related activity. Due to the lack of springs in the area and the lack of underground development/activity, no ground water monitoring is required at this time by the approved Mining and Reclamation Plan (MRP).

Section UMC 817.52 of the approved MRP discusses the water-monitoring plan. The two surface monitoring sites will be sampled and measured during the months of May and September (2nd and 3rd quarters only). Field parameters will be measured and water samples collected at the same time. Parameters for water analysis are listed in section UMC817.52 of the MRP. There are no springs, ponds or wells on the site. The monitoring program will continue until bond release is obtained.

The Utah Division of Water Quality (DWQ) has assigned use classifications to Ivie Creek and its tributaries from the confluence with Muddy Creek to Utah highway 10. The classifications are:

- 2B: Protected for secondary contact recreation such as boating, wading or similar uses.
- 3C: Protected for non-game fish and other aquatic life, including necessary aquatic organisms in their food chain.
- 4: Protected for agricultural uses including irrigation of crops and stock watering.

Numeric criteria set forth in Utah Administrative Code (UAC) R317-14, have been established for each of the beneficial use classes assigned to waters in the State. Of the use

classifications assigned to the streams in the Western Colorado River Watershed (WCRW), numeric criteria for TDS only apply for agricultural use (beneficial use class 4). Section R317-2 of the UAC identifies a standard TDS value of 2,600 mg/L for Ivie Creek and its tributaries. The primary factors for increased TDS loads in the lower reaches of the Muddy Creek Watershed are from agricultural irrigation practices, surface runoff and natural geological loadings.

**1. Was data submitted for all of required sites?**

**Streams**

YES [X] NO [ ] Data was reported for both surface water monitoring sites (Upper Ivie #1 and Lower Ivie #2).

**2. Were all required parameters reported for each site?**

**Streams** YES [X] NO [ ]

**3. Were irregularities found in the data?**

**Streams** YES [X] NO [ ]

Values obtained for pH and TDS for this quarter follow established seasonal trends (See Attached Figures).

A TDS value of 2,600 mg/L is the site-specific standard as established by UAC R317-2, *Standards for Waters of the State*. The TDS values obtained for both Upper Ivie #1 and Lower Ivie #2 for this quarter were 4,214 and 4,255 mg/L respectively.

The Price River, San Rafael River and Muddy Creek TMDLs for Total dissolved Solids West Colorado Watershed Management Unit, Utah document (Utah Division of Water Quality, 2004) discusses how although seasonal variations in TDS concentrations have been detected, it's also been noted that there is no one critical season for high TDS concentrations in the Muddy Creek watershed. The report states, "the average measured TDS concentrations consistently exceed the TDS criterion over the entire year".

The Ivie Creek drainage has consistently produced TDS levels well above the 2,600-mg/L standard discussed above. However, as the site has been reclaimed, it's unlikely that the elevated TDS levels are a result of coal mining related activity. Recent field inspections by Division staff have documented the site as being in stable condition with no signs of excessive erosion or gullies.

Flow values obtained from both sampling sites were exceptionally lower than the

previous year. A flow value of 296 gallons per minute (gpm) from Upper Ivie #1 was obtained in May of 2008. The May 2009 flow-sampling event for Upper Ivie #1 produced a flow value of 80.74 gpm. Similarly, the May 2008 flow-sampling event at Lower Ivie #2 produced a flow value of 255.816 with a corresponding May 2009 flow value of 71 gpm. At present it is unknown as to what has caused this significant drop in flow for Ivie Creek as typically the spring and early summer months produce markedly higher flow values as a result of snowmelt, increased precipitation and irrigation return flows.

As the mine is in temporary cessation and not utilizing/diverting any water from the Ivie Creek drainage or local groundwater, it's highly unlikely that coal-mining activity produced this drop in flow. Historically, the spring sampling events on the Ivie Creek drainage produced flow values in the range of 300 gpm. Why the flow has dropped to less than half of what has been historically produced is unknown at this time.

**4. On what date does the MRP require a five-year resampling of baseline water data.**

The approved MRP does not outline a five-year baseline re-sampling requirement.

**5. Based on your review, what further actions, if any, do you recommend?**

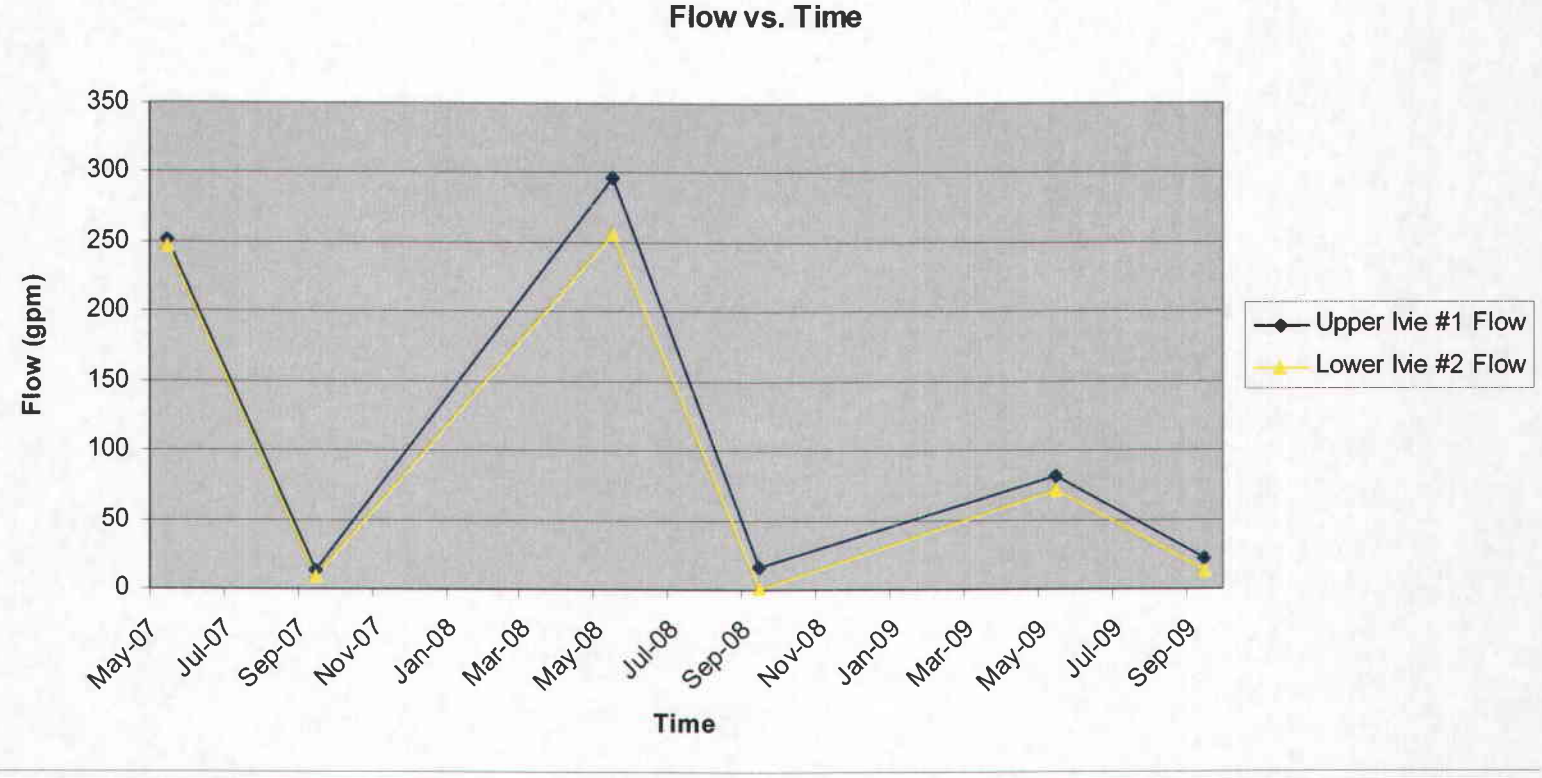
Additional investigation/analyses should be performed to identify what may have caused a pronounced drop in flow in the Ivie Creek drainage.

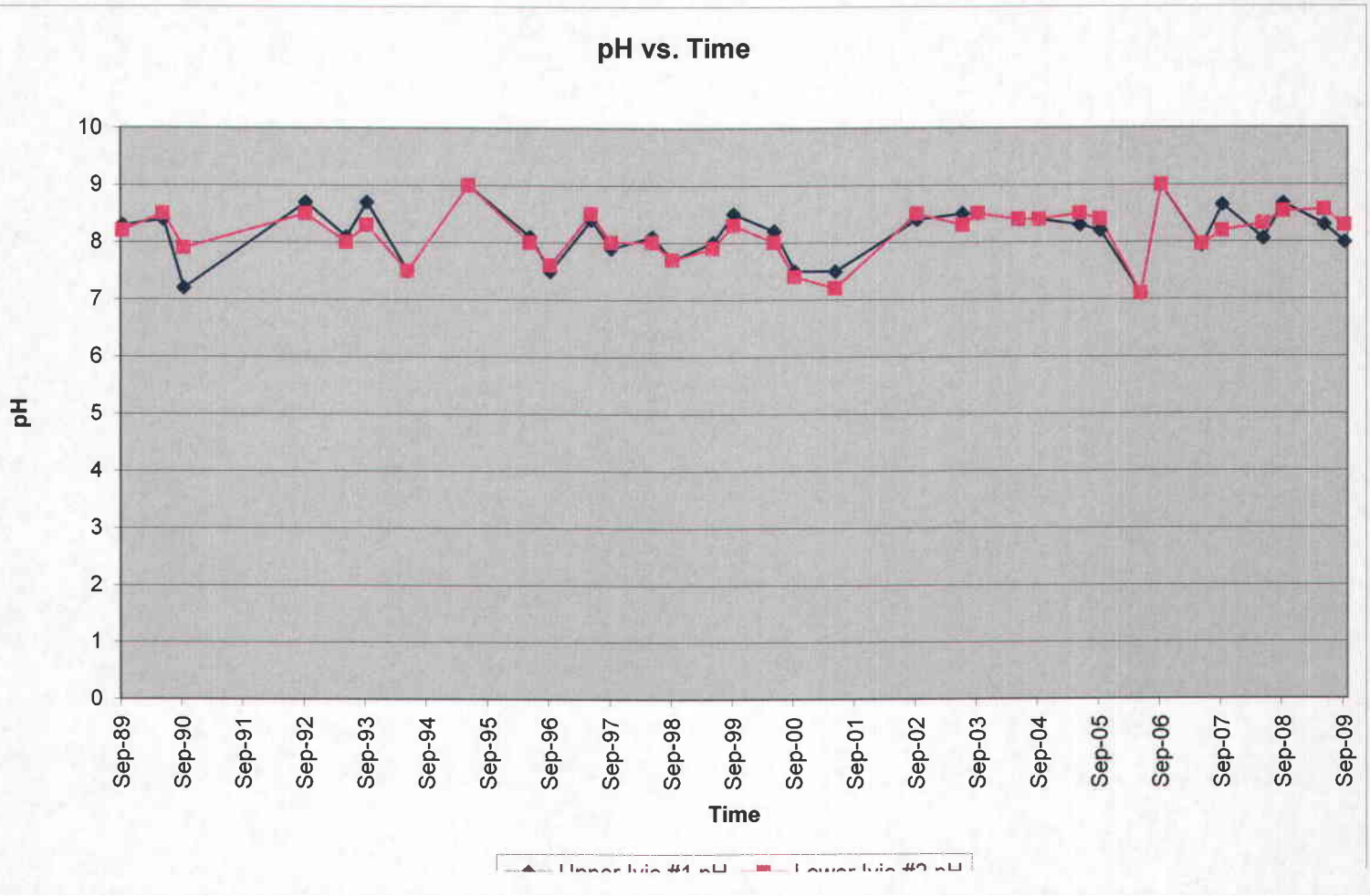
**Does the Mine Operator need to submit more information to fulfill this quarter's monitoring requirements?**

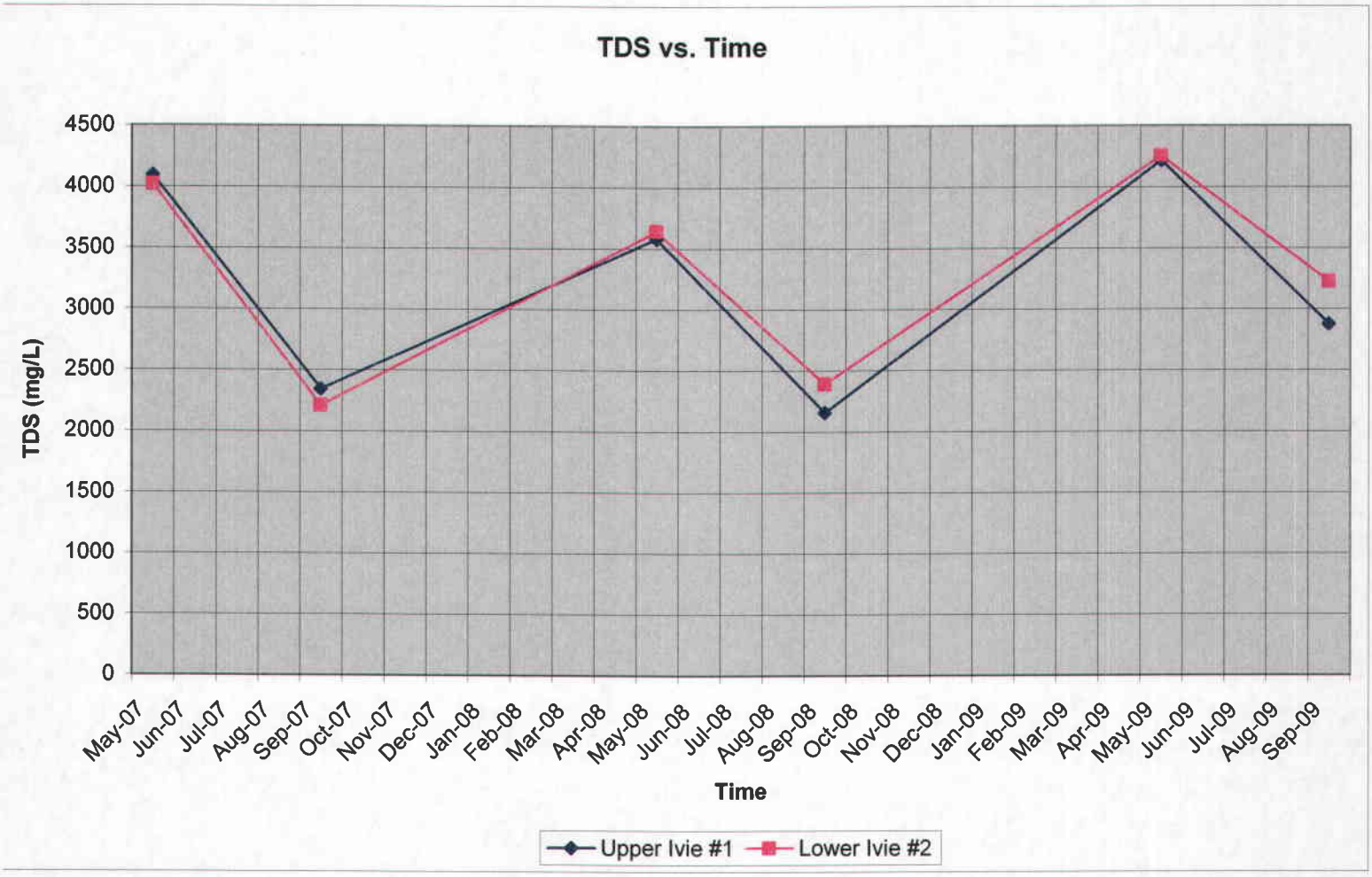
[ ] YES [X] NO

**6. Follow-up from last quarter, if necessary. Did the Mine Operator submit all the missing and/or irregular data (datum)?**

NA.


Flow vs. Time
Flow (gpm)
350
300
250
200
150
100
50
0
May-07
Jul-07
Sep-07
Nov-07
Jan-08
Mar-08
May-08
Jul-08
Sep-08
Nov-08
Jan-09
Mar-09
May-09
Jul-09
Sep-09
Time
Upper Ivie #1 Flow
Lower Ivie #2 Flow


pH vs. Time
pH
10
9
8
7
6
5
4
3
2
1
0
Sep-89
Sep-90
Sep-91
Sep-92
Sep-93
Sep-94
Sep-95
Sep-96
Sep-97
Sep-98
Sep-99
Sep-00
Sep-01
Sep-02
Sep-03
Sep-04
Sep-05
Sep-06
Sep-07
Sep-08
Sep-09
Time


TDS vs. Time
TDS (mg/L)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Jan-08
Feb-08
Mar-08
Apr-08
May-08
Jun-08
Jul-08
Aug-08
Sep-08
Oct-08
Nov-08
Dec-08
Jan-09
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Jul-09
Aug-09
Sep-09
Time
Upper Ivie #1
Lower Ivie #2